Application/Control Number: 10/083,812
Art Unit: 2171

Docket No.: 2000-0352

REMARKS

Reconsideration and allowance are requested. Claims 1 - 40 are pending and no claims are amended.

The Examiner objected to the drawings in the Office Action Summary but no details were provided regarding why. We confirm in a teleconference with the Examiner that this notation on paragraph 10(b) of the Office Action Summary was in error and that the Drawings are accepted by the Examiner.

The Examiner objected to claims 6 - 10, 12 - 24, 27 - 30, 33 - 37, 39 and 40 as being dependent on a rejected base claim but would be allowable of rewritten. Applicant believes as set forth below that the parent claims are allowable over the prior art. Therefore, at this time, no claim amendments are provided.

Rejection of Claims 1 - 4, 11, 25, 26, 31, 32 and 38 Under Section 103

The Examiner rejects claims 1 - 4, 11, 25, 26, 31, 32 and 38 under Section 103 as being unpatentable over U.S. Patent No. 6,665,790 to Glossner et al. ("Glossner et al.") in view of U.S. Patent No. 6,567,709 to Malm et al. ("Malm et al.") and further in view of U.S. Patent No. 6,023,673 to Bakis et al. ("Bakis et al."). Applicant traverses this rejection and submits that there is no suggestion to combine these references and even if combined, they still fail to teach each limitation of the claims. We first turn to claim 1.

To establish a *prima facie* case of obviousness, the Examiner must meet three criteria. First, there must be some motivation or suggestion, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to combine the references. Second, there must be a reasonable expectation of success, and finally, the prior art references must teach or suggest all the claim limitations. The Examiner bears the initial burden of providing some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the

examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP 2142.

First, Applicant submits that there is no motivation or suggestion to combine Glossner et al. with Malm et al. When analyzing references for their suggestive power, the MPEP requires that all the teachings in the prior art must be considered regarding what they would have suggested to one of ordinary skill in the art. MPEP 2143.01. In the present case, when the entire teachings of the prior art are analyzed, it becomes clearer that there is no suggestion or motivation to combine these references. Malm et al. provides an integrated monitoring diagnostics, shut down and control system. The purpose of the system is for monitoring, controlling, diagnosing and determining the performance of machines used to develop mechanical energy such as reciprocating engines machines driven by a rotating shaft. Examples of these machines include electrical generators, rotating and reciprocating compressors, rotating and reciprocating pumps, propellers such as air and water propellers, water and gas turbines and the like. Malm et al. provide a data acquisition process for use in the monitoring and control of such equipment having rotating members including a shaft. Their disclosed method provides steps of sampling a condition sensor output indicating a condition of the rotating equipment that requires monitoring, sampling and indicating the rotational position of the shaft and combining the condition signal and the rotational marker signal. See Abstract. The table in columns five and six of the reference provide information about the kind of data obtained by the sensor arrays. Sensor classes include an accelerometer and optical class, inductive class and so forth. The number of sensors in each array ranges from 1 to 20.

As can be appreciated by this introduction and explanation of this reference, one of skill in the art will understand that this is certainly related to industrial type equipment and the monitoring and control of such equipment. The number of data points in such equipment

is relatively low. As mentioned above regarding the table in columns five and six, the data points from each sensor are not taught as being above 20. Figures 17, 18, 19 and 20 illustrate the examples of the type of the sensors contemplated in this reference. These relate to the years revolutions vibrational pressure or other signals and time. Furthermore, the only place in the entire reference where vectors are mentioned is in column 15 lines 43 and 44 in which the inventors list a number of data processing techniques such as Fourier transforms, vector dot products and vector mathematical processes to process the data extracted from the sensors. There is no other mention of factors in this reference. As shall be seen next, the focus of this reference would not suggest to one of skill in the art that it could be combined with Glossner et al.

Glossner et al. teach a vector register file with arbitrary vector addressing. Their invention focuses on a system and method for processing operations to use data vectors each comprising a plurality of valid data elements. Part of their invention includes a vector data file having a plurality of storage elements that store the various data elements of the data vectors. A pointer is couple by a bus to the vector data file and includes a plurality of entries wherein each entry identifies at least one storage element in the vector data file. Column 1 of the reference explains in lines 7 through 14 that the invention relates to digital processing, for example, processing employing multimedia processors, single instruction multiple data processors, digital signal processors with single instruction and multiple data processing capability in similar devices. More particularly, the vector register files are used in digital processing to temporarily store inputs and outputs of computations. Line 18 of column one again mentions the use of media data or digital signal processing algorithms. The purpose of their invention in the context of media or digital signal processing is to address the problem where many algorithms require irregular access to vector elements because the algorithms utilize table lookup means or because the elements require some address permutation such as bit reversal. The performance of an algorithm which must access vector element in this

manner is reduced because of the storage structure of data vectors. Accordingly, their invention addresses the problem by providing a vector register architecture that permits various modes of operation in the same structure to optimize the performance in digital signal processing and specifically to multimedia processors.

There are several reasons why one of skill in the art would not find any motivation to combine the first reference with the second reference. When the whole teachings of each reference are identified and understood it becomes clear that Malm et al. is simply related to control and monitoring of industrial equipment. The data obtained from the sensors is limited, the need to access data obtained from a sensor in an irregular way is not mentioned or suggested in the application is clearly within a certain context of industrial equipment. In contrast, Glossner et al. clearly focus on multimedia data processing. One of skill in the art would certainly understand that the number of data elements used in multimedia communication is vastly different than the number of data elements that may be received from a piece of industrial equipment having an element such as a rotating shaft. The number of data elements that may be required, for example, to present a multimedia movie in the digital format would greatly exceed the 20 data elements identified in the first reference table in columns five and six of Malm et al. Therefore, Glossner et al. clearly does have a need in that the multimedia context for optimization of processor performance given the difference in magnitude of the data to be processed. However, no such need appears to exist for Malm et al. where the amount of sensor data is so limited in comparison amount of data in multimedia communications. Furthermore, since there is only a passing reference in the first reference to vectors, there does not appear to be any focus on using and processing vectors in the first reference.

Therefore, Applicants Applicant respectfully submits that the industrial equipment sensor and control invention of Malm et al. would not suggest to one of skill in the art that she could be combined with the multimedia digital vector processing invention of Glossner et

al. The suggestive the power of each of these references essentially teaches away from the need for their combination.

In addition to this, Applicant submits that even if these references were combined they would still not teach each limitation of claim 1. Claim 1 recites a pattern matching method comprising, from a data set, generating vectors from plurality of partitions of the data set in reducing each generated vector to a lower dimensional vector. The Examiner asserts that Glossner et al. disclose reducing each generated vector to lower dimensional vector by citing columns 15 lines 30 to 50. Applicant traverses this analysis and asserts that the second reference does not teach reducing the each generated vector to a lower dimensional vector. They do teach the digital data obtained from the sensors can be stored for transmission to another computer or can be processed using a range of data processing techniques to extract information that relates to the performance of machinery or to a specific condition. The teaching of Malm et al. is that the resulting numerical information extracted from the digital data from the sensors can be reduced using standard data base electronic file data compression or averaging techniques. The next sentence starting on line at 41 lists example data processing techniques. These include frequency analysis with frequency transforms such as Fourier transforms, vector dot products, vector mathematical processes, matrix mathematics, digital filtering and so forth. As mentioned of line 37, these data processing techniques are used to extract numerical information that relates to the performance of the machinery. Therefore, the mention of vector dot products and vector mathematics are not in the context of reducing the generated vector to a lower dimensional factor but are taught in the context of processing the numerical data identified by extracting information from the sensor digital data.

When Malm et al. discuss reducing the resulting numerical information, they only do so in the context of data compression for storage. Furthermore, the information that is taught as being reduced is not taught as being a generated vector. What is being reduced in this

reference is extracted numerical information relating to the performance of the machinery from a data obtained from the sensors. Malm et al. are silent with regards to whether this numerical information is a generated vector. Given the type of sensor input received from the industrial equipment, one of skill in the art would be led to believe that the extracted numerical information about performance of the machinery is not vector data but simply numerical data related to the sensor information.

The Examiner asserted that one of skill in the art would find motivation to modify Glossner et al. to include reducing each generated vector to a lower dimensional vector as taught by Malm et al. However, as discussed above, Malm et al. simply do not teach processing a generated vector but rather processing numerical data extracted from the digital sensor data. Furthermore, the Examiner asserts that there is motivation to modify Glossner et al. above for the purpose of extracting numerical information that relates to the performance of the machine or a specific condition. This motivation does not exist, however, because Glossner et al. as discussed above teaches processing multimedia digital data. There is no reference in Glossner et al. to any desire to monitor industrial machines. In fact, the multimedia component of Glossner et al. would lead one of skill in the art away from any industrial machine context where sensor data would have to be extracted. These two references have completely different contexts and Applicant submits that there is no motivation to combine or blend their teachings.

Accordingly, Applicant submits that the suggestive power of each reference would not lead one of skill in the art to combine the teachings of Malm et al. with Glossner et al. Furthermore, even if combined, they don't teach each limitation of claim 1. Therefore, claim is patentable and in condition for allowance.

Furthermore, since there is no suggestion to combine these two references, Applicant submits that claims 2 - 4, 11, 25, 26, 31, 32 and 38, and their dependent claims, are also patentable and in condition for allowance.

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CONCLUSION

Having addressed the rejection of claims, Applicant respectfully submits that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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